

REMARKS

Claims 1-8 and 10-12 are pending in this application. Claim 9 has been canceled without prejudice.

Claims 1 and 5-7 have been amended to improve clarity. No new matter has been added by way of the above-amendment.

Claims Objections

Claim 5 is objected to for reciting the phrase “characterized by obtainable by” at line 1. In response, Applicants have replaced this phrase with the phrase “prepared in”.

As such, withdrawal of the objection is respectfully requested.

Advantages of the Present Invention

As noted above, Applicants have amended claims 1 and 5-7 to require that the polyether polymer composition is prepared in a process comprising:

- forming a slurry comprising:
 - an organic solvent,
 - an antioxidant which is insoluble in the organic solvent
 - a stabilizer which is soluble in the organic solvent and
 - a polyether polymer dispersed therein; and then,
- removing the organic solvent from the slurry.

As described in the Examples of the present specification, the above-described polyether polymer composition is structurally distinct from the compositions of the cited art and has an unexpected improvement in storage stability and processing stability.

Nishio et al.

The following rejections are pending:

- (A) Claims 1, 2, and 4 are rejected under 35 U.S.C. 102(a) as being anticipated by Nishio et al. (WO 03/002669); and
- (B) Claims 5 and 11 are rejected under 35 U.S.C. 102(a) as being anticipated by Nishio et al.

Applicants respectfully traverse both Rejection (A) and (B).

Nishio et al. describe the incorporation of 4,4'-thiobis(6-tert-butyl-3-methylphenol) as an antioxidant in a slurry of the polyether polymer composition in n-hexane (that is, incorporation of an antioxidant in a polyether polymer slurry, which antioxidant is insoluble in an organic solvent in the slurry). However, Nishio et al. are silent on the incorporation of a **stabilizer** which is soluble in the organic solvent in the slurry. Accordingly, the presently claimed invention is clearly not anticipated.

With respect to obviousness, the benefit of the presently claimed invention over Nishio et al can be seen from the comparison of Examples 1 and 2 with Example 7. The combined use of the insoluble antioxidant with the soluble stabilizer shown in Example 7 gives a polyether polymer composition exhibiting improved storage stability (as evaluated by the reduced change in the reduced viscosity as measured after standing at 40°C for 70 hours), and improved processing stability (as evaluated by the reduced change in the reduced viscosity as measured after kneading at 60°C for 2 minutes by Brabender Plastometer), as compared to the polyether polymer composition with just the insoluble antioxidant shown in Examples 1 and 2.

Accordingly, significant patentable distinctions exist between the present invention and the teachings of Nishio et al. As such, withdrawal of Rejection A and Rejection B is respectfully requested.

Meier et al.

(C) Claims 6, 7 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by Meier et al., US 6,028,131. Applicants respectfully traverse Rejection (C).

As noted above, the presently claimed polyether polymer composition requires the **combined use** of antioxidant and stabilizer. This is the fundamental difference between the presently claimed polyether polymer composition and Meier et al. That is, Meier et al are silent on the **combined use** of antioxidant and stabilizer. Accordingly, the presently claimed invention is clearly not anticipated.

With respect to obviousness, in the presently claimed invention, it is important firstly that a stabilizer, which is soluble in an organic solvent in the slurry of a polyether polymer, is incorporated in the polyether polymer slurry. This can be seen in the data of Table 2 of the present specification which is reproduced in the following Table for the Examiner's convenience.

Table

	Ex. 4	Ex. 5	Ex. 7	Com.Ex. 3
Polyether polymer	EO/PO/AGE	EO/PO/AGE	EO/PO/AGE	EO/PO/AGE
Stabilizer	Yes/soluble	Yes/soluble	Yes/soluble	Yes/insoluble
Antioxidant	No	No	Yes	No
Solvent in slurry	n-hexane	n-hexane	n-hexane	n-hexane
Gel content after heat-drying (%)	0.1	0.1	0	6.5
Gel content after kept in nitrogen atmosphere for 70 hrs (%)	0.1	0.2	0	8.2
Gel content after kneading by Brabender (%)	0.2	0.3	0.1	10.1

As seen from the comparison of Examples 4 and 5 with Comparative Example 3 in the above-Table, in the case when the stabilizer is insoluble in the organic solvent in the slurry of polyether polymer, the resulting polyether polymer composition exhibits an undesirably large gel content, and, when the polymer composition is stored in a nitrogen atmosphere or kneaded by Brabender Plastometer, the gel content is increased (Comparative Example 3).

Secondly it is important that the soluble stabilizer is incorporated in combination with an insoluble antioxidant in the polyether polymer slurry. As shown in Examples 4 and 5 in the above-Table, even though a stabilizer, which is soluble in an organic solvent in the slurry of a polyether polymer, is used, the gel content of polymer as measured after heat-drying is 0.1 wt.% by weight,

that as measured after kept in nitrogen atmosphere for 70 hours is 0.1 or 0.2 wt.% and that as measured after being kneaded by Brabender Plastometer is 0.2 or 0.3 wt.%. In contrast, as shown in Example 7, when the soluble stabilizer is used in combination with an insoluble antioxidant, the gel content of polymer as measured after heat-drying is 0 wt.% by weight, that as measured after kept in nitrogen atmosphere for 70 hours is 0 wt.% and that as measured after kneaded by Brabender Plastometer is 0.1 wt.% (see also page 29, second paragraph).

Meier et al fail to teach either the incorporation of the stabilizer in the slurry of a polyether polymer in an organic solvent in which the stabilizer is soluble, or the incorporation of the soluble stabilizer in combination with the insoluble antioxidant in the polyether polymer slurry.

We now turn to the specific teachings of Meier et al. The Examiner has taken the position that Meier et al. teach the following Requirements (2) and (3) of inventive claim 6 which are as follows:

- (2) the polyether polymer has a gel content of not larger than 5% by weight, and
- (3) at least 50% by weight of the total amount of the stabilizer in the composition exists within the polyether polymer particle.

Applicants note that Meier et al. generically teach combining anti-oxidants with a large laundry list of polymers. This laundry list covers from column 3, line 51 to column 7, line 24. Within this large laundry list of possible polymers, Meier et al. includes polyethers at column 5, lines 66-67. As such, it is not clear how the present invention could be found obvious, let alone anticipated by Meier et al.

With respect to inventive Requirement (2), the Examiner relies upon Example A4 at column 24 of Meier et al. However, the gel content is described only for crude rubbers and not for polyether polymers. Further, the additives are mixed into crude rubber (polybutadiene) by kneading together by a tam compounder (Brabender) in Examples A3 and A4. That is, Meier et al are silent on the procedure of incorporating the insoluble antioxidant and the soluble stabilizer in a slurry of polyether polymer in an organic solvent as required in claim 6 of the presently claimed invention.

With respect to inventive Requirement (3), the Examiner relies upon the teachings of Meier et al. at column 3, lines 34-39. However, upon careful review of Meier et al., it appears that

the description that 50 percent of the antioxidants can be incorporated in the polymer particles is only relevant to polymers that have unsaturated bonds along the backbone. For polymers such as polyethers of the present invention (that do not have unsaturated bonds along the backbone), Meier et al. teach that the compounds of formula I (antioxidants) are admixed, see column 3, lines 44-46 of Meier et al. Applicants respectfully submit that admixing the antioxidant with the polyether would not give at least 50 percent of the antioxidants incorporated in the polymer particles, as described in Requirement (3).

Further, Meier et al teach that the incorporation can take place via the SO group onto double bonds in the substrate polymer. In the presently claimed invention, a predominant part of the soluble stabilizer incorporated in the polyether polymer slurry exists within the polyether polymer particle, and a predominant part of the insoluble antioxidant incorporated in the composition is deposited on the surface of the polyether polymer particle.

Accordingly, significant patentable distinctions exist between the present invention and the teachings of Meier et al. As such, withdrawal of Rejection C is respectfully requested.

Miura et al., Lascaud et al. and Bhatia et al.

The following rejections are pending:

- (D) Claims 1 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Lascaud et al. (WO 01/084659). Note: U.S. Publication U.S. 2003/0108799 is being used as an English language equivalent of WO 01/084659 and all references will be directed towards the U.S. document;
- (E) Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Lascaud et al. (WO 01/084659); and
- (F) Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Lascaud et al. (WO 01/084659) as applied to claim 1 above, and further in view of Bhatia et al. (JP 08-188653).

Applicants respectfully traverse Rejections (D)-(F).

Miura et al describe the formation of a slurry of a polyether polymer in an organic solvent at polymerization, and the removal of the solvent after completion of polymerization. Based on the Examiner's comments, the Examiner appears to be aware that Miura et al. do not teach or fairly suggest adding an antioxidant to the polyether composition containing polyether particles. In order

to cure this deficiency, the Examiner cites Lascaud et al. Furthermore, the Examiner cites Bhatia et al. for the notion that Bhatia et al. fairly suggest modifying the slurry of Miura et al. so as to have an antioxidant incorporated in the slurry to prepare a slurry having the antioxidant dispersed therein.

However, Applicants respectfully submit that Lascaud et al and Bhatia et al fail to cure the deficiencies of Miura et al., since Lascaud et al and Bhatia et al fail to even hint at the incorporation of the insoluble antioxidant in combination with the soluble stabilizer.

Accordingly, significant patentable distinctions exist between the present invention and the teachings of Miura et al. in combination with Lascaud et al and optionally Bhatia et al. As such, withdrawal of Rejections D-F is respectfully requested.

Miura et al. and Meier et al.

(G) Claims 6 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Meier et al. (U.S. Pat 6,028,131). Applicants respectfully traverse Rejection G.

Applicants respectfully submit that the above comments with respect to the patentable distinctions between Miura et al. and Meier et al. and the present invention are equally applicable to this rejection. As such, withdrawal of Rejection G is respectfully requested.

Miura et al. and Takeda et al.

The following rejections are pending:

- (H) Claims 1, 3, and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Takeda et al. (U.S. Pat. 5,658,687); and
(I) Claims 5 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miura et al. (U.S. Pat. 5,968,681) in view of Takeda et al. (U.S. Pat. 5,658,687).

Applicants respectfully traverse Rejections H and I.

Applicants note that the Examiner has taken the position that Miura et al. fail to teach or fairly suggest adding an antioxidant to the polyether composition. In order to cure this

deficiency, the Examiner cites Takeda et al. However, Applicants respectfully submit that the skilled artisan would not look to Takeda et al. to modify Miura et al.

As motivation for combining the references, the Examiner states that the artisan would be motivated to add the antioxidant of Takeda et al. to reduce the free polymerization of the high molecular weight compounds, see column 7, lines 59-65 of Takeda et al. However, the Examiner will note that this is opposite to the purpose of the antioxidants in the present invention as described at page 9, last full paragraph of the present specification. As such, the skilled artisan would not be motivated to add the antioxidant of Takeda et al. to the polyether of Miura et al., since the skilled artisan would not believe there is a possibility of free polymerization in the presently claimed polyethers as would be found with the types of polymers of Takeda et al. having unsaturated portions, see formulae (I) and (II) at column 7.

Furthermore, both of Miura et al and Takeda et al suggest nothing about the incorporation of the insoluble antioxidant *combined with* the soluble stabilizer in a slurry of polyether polymer. As such, even if an artisan would be motivated to add the antioxidant of Takeda et al to the polymer slurry of Miura et al, the presently claimed invention would not be derived from the hypothetical combination of Miura et al with Takeda et al.

Accordingly, significant patentable distinctions exist between the present invention and the teachings of Miura et al and Takeda et al. As such, withdrawal of Rejections H-I is respectfully requested.

Conclusion

Entry of the above amendments is earnestly solicited. An early and favorable first action on the merits is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Garth M. Dahlen (Reg. No. 43,575) at the telephone number of the undersigned below, to conduct an interview in an effort to expedite prosecution in connection with the present application.


Application No. 10/536,986
Amendment dated March 20, 2008
Reply to Office Action of September 21, 2007

Docket No.: 1600-0161PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37.C.F.R. §§1.16 or 1.14; particularly, extension of time fees.

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Respectfully submitted,

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